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synthesis. The principal generalizations arising from the studies are as follows:

An *Echinocactus* in the open may survive no more than two years at the expense of its surplus food material and water. Similar plants in diffuse light have been seen to be sound after six years of starvation, although the effects were marked.

Non-reducing soluble sugars which are present in only minute proportions if at all in normal *Echinocacti*, are noticeable constituents of the sap of desiccated plants.

Extended desiccation and starvation made no alteration in the integument of *Echinocactus*, but in a plant which had been thus treated for 73 months the cuticle was thicker than the normal, while the outer wall of the epidermal cells was thinner. Cytoplasm and nuclei in the epidermal system were reduced but new cork layers were being formed as in the normal. Division was seen in the epidermal layer at the bottom of the grooves of the stem. The stomata remained permanently open and many were in a collapsed condition. Guard cells of stomata differed from the normal in having anterior walls thinner as compared with the posterior walls.

The palisade layer was thinner than in normal plants of *Echinocactus*. The cytoplasm was reduced to small masses in the angles of the cells, and the nuclei were variously deformed and reduced in size. Vacuoles had disappeared from the nucleoplasm and a thickened granular layer was present in the peripheral portion.

The most pronounced effects of desiccation and starvation were exhibited by the cortex of *Echinocactus*. The changes noted as having been seen in the palisade tissues were followed by the entire disappearance of the protoplasts and the hydrolyzation of the cell masses formed lacunæ as large as 8 cubic centimeters.

On Wednesday, August 4, Section G and the Biological Society of the Pacific held a dinner at the Hotel Sutter, San Francisco.

W. J. V. OSTERHOUT, *Secretary*

#### SOCIETIES AND ACADEMIES

##### BIOLOGICAL SOCIETY OF WASHINGTON

THE 544th meeting of the Biological Society of Washington was held in the Assembly Hall of the Cosmos Club Saturday, November 6, 1915, called to order by President Bartsch, with 90 persons present.

On recommendation of the council, Gilbert F. Bateman, Trinidad, Colorado, was elected to active membership.

The first paper of the regular program was by O. P. Hay, "A New Pleistocene Sloth from Texas." Dr. Hay discussed the finding in Texas of a new member of the genus *Nothrotherium*. This discovery extends the range of the genus from South into North America. The specimen was exhibited and remarks were made on the interrelationships and distribution of the living and fossil American Edentates.

The second paper was by J. N. Rose, "Botanical Explorations in South America." Dr. Rose gave an account of his botanical explorations in South America. He outlined first the field work which he and Dr. N. L. Britton had planned in connection with the cactus investigations of the Carnegie Institution of Washington and then proceeded to describe the great cactus deserts of South America which he had visited. During his last trip to South America he spent six weeks in the state of Bahia, Brazil, six weeks in the state of Rio de Janeiro, Brazil, and three weeks in Argentina. Large collections were obtained. Many living plants were sent back to the United States for cultivation. The living collection is now on exhibition in the New York Botanical Garden. Several remarkable generic types of cacti were discovered. Dr. Rose's paper was illustrated by numerous lantern slides of regions visited, of cacti in their native environment; and by many interesting botanical specimens.

The last paper of the evening was by Dr. L. O. Howard, "Some Biological Pictures of Oahu (Hawaii)." Dr. Howard showed a large number of lantern slides from photographs made by him during a short stay the past summer on the island of Oahu. Special emphasis was laid on those which dealt with agricultural problems and economic entomology, many of which are peculiar to the Hawaiian Island.

M. W. LYON, JR.,  
*Recording Secretary*

#### THE NEW ORLEANS ACADEMY OF SCIENCES

THE regular meeting of the academy was held in Tulane University on Tuesday, November 16, 1915, Dr. Gustav Mann, president, in the chair.

The paper of the evening was by Dr. W. H. Dalrymple, of the Louisiana State University, on "The History of the Cattle Tick Fight in Louisiana." Dr. Dalrymple gave a brief history of the fight in Louisiana, first, by individual effort, then by state effort, and, finally, by federal aid. The paper proved of considerable interest and there was much discussion at the close.

R. S. COCKS, *Secretary*